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Majorana spectroscopy of Kitaev spin-liquids

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Theoretically, some quantum spin liquids (QSLs) – new topological phases which can occur when quantum fluctuations preclude an ordered state – are known to exhibit Majorana fermions as quasiparticles arising from fractionalization of spins. Alas, despite much searching, their experimental observation remains elusive. Here, we analyse the dynamical response of a range of Kitaev quantum spin-liquids. Our results test the usefulness of inelastic neutron and light scattering as a probe of these quantum spin liquids: we find that although spin flips fractionalise, the main features of the dynamical spin response nevertheless admit straightforward interpretations in terms of Majorana and flux loop excitations. I will discuss connections to recent experiments on RuCl_3 .